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PECOS WILDERNESS INFORMATION AND EDUCATION NEEDS ANALYSIS AND ACTION PLAN

SANTA FE NATIONAL FOREST
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CLEMSON UNIVERSITY CLASS OF 1988

This paper was prepared as a student project in partial fullfillment of the requirements of the Professional Development for Outdoor Recreation Management Program at Clemson University. It in no way reflects USDA Forest Service policy, nor are the opinions expressed those of anyone other than the author.

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PROJECT ABSTRACT

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Title: Pecos Wilderness Information and Education Needs Analysis and Action Plan

Abstract: The Pecos Wilderness of the Santa Fe National Forest is one of the regions most popular wilderness areas. The Wilderness integrity is perceived by local managers to be suffering, and is evident by visible impacts on the land resulting from user activities.

An analysis of the situation was undertaken looking at characteristics of use, perceived problems and their causes, management direction, and potential ways of addressing the problems. Greater information and education efforts were determined to be the primary tool to effect desired changes. An information and education plan was developed which outlines a course of action to be followed.

Keywords: Wilderness, education, information.

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I. INTRODUCTION

A. THE SETTING

The Pecos Wilderness is located in northern New Mexico, just east of Santa Fe, the state capitol. The Pecos Wilderness consists of 222,673 acres of the Santa Fe and Carson National Forests. The majority of the wilderness is managed by the Pecos Ranger District of the Santa Fe National Forest.

The area contains some of the region's most picturesque and beautiful natural scenery. It is noted for rugged alpine peaks, cold cirque lakes, large open grass parks, and numerous streams. The headwaters of the Pecos River are located in the wilderness, as is Truchas Peak, which at an elevation of 13,103 feet, is the state's second highest.

The Pecos Wilderness is also noted for its varied wildlife, and fish resources. The area supports populations of big horn sheep, black bear, elk, deer, turkey, grouse, and several species of trout. In addition, there are numerous numerous non-game animals.

The wilderness is a very popular area for recreational activities such as hiking, camping, horseback riding, and hunting. Consequently, it receives some of the heaviest use in the region. The use is characterized by poor distribution, predominately in the lake basins. This results in some areas being undesireably impacted. For example, there are five primary wilderness access trailheads on the Pecos Ranger District, all within a 10 mile radius.

The 20 mile proximity of the wilderness to Santa Fe, and relative proximity of 60 miles to the large metropolitan area of Albuquerque, provide opportunities for many people to use the area for daytime activities, as well as overnight stays. As these communities continue to grow it can be expected that the use of wilderness will also grow.

Presently very few of the wilderness visitors have any contact with forest service representatives. There is no permit system for general use of the wilderness. Wilderness information is not readily available to many users.

B. PURPOSE OF STUDY

The primary purpose of this paper is to document the analysis which has been made regarding the impact of user behavior on the wilderness; then to review educational resource options which can be used to reach users; and finally to discuss the relationship between education and impact.

From the analysis a course of action will be planned to help reach desired goals. The analysis and action plan will be a tool for present and future wilderness managers' to utilize for improved public service and resource protection.

The primary intent of the Wilderness Act was the preservation of natural conditions and outstanding opportunities for solitude. Present levels and characteristics for recreation use in the Pecos Wilderness has challenged the managers' ability to meet the intent of the law. This study is intended to help managers meet the challenge of balancing wilderness use and resource protection.

The final desired product of implementation of the action plan is an increased number of wilderness users who demonstrate respect for the land and recognize that they are responsible for the health and integrity of the wilderness. In essence the goal is to teach a "wilderness ethic." Teaching a wilderness ethic stresses the philosophy of wilderness values and individual responsibility in relation of these values.

A sign at the entrance to Tanzania National Park sums up the message we are trying to convey to wilderness users:

> Let no one say
> and say it to your shame
> that all was beauty here
> until you came.

II. METHODOLOGY

In carrying out this analysis and proposal various steps were taken. After clearly identifying what the problems were, and their causes, a search for solutions was begun. A focus was given to how this analysis and proposal would address the problem, who would benefit from this paper, and how this study could be of practical use.

A lengthy literature review was undertaken to research the issues. Contacts with groups and individuals perceived to be interested or knowledgeable about the issues were carried out. Organizational policy and tradition was analyzed.

Researchers have found that most wilderness management problems related to resource protection result from recreational use (Hendee, Stankey, Lucas, 1978). Futhermore, many wilderness management problems result from the users' lack of knowledge (Godin and Leonard, 1979; Leopold, 1946; Stegner, 1985; Zaslowsky, 1984, Bradley, 1980;

Hampton and Cole, 1988). Much research indicates that there is a strong relationship between visitor knowledge and behavior (Lucas, 1974; Lime and Stankey, 1971; Hendee et al., 1978; Robertson, 1981).

The current level of knowledge of appropriate behaviors for backcountry users is moderately low, and less than that which is desired (Hill, 1975; Young, 1978; Fazio, 1979; Robertson, 1981).

Hill's wilderness conduct survey (1975) demonstrated that students in the hiking and backpacking classes at the University of Utah were limited in their awareness of appropriate behavior in the wilderness. (Hill, 1975, p. 54).

Young (1978) studied the level of information about wilderness concept held by the general public. The results showed the information level was quite low. The results also showed a direct relationship between the public level of information and their attitude towards the wilderness.

It is clear that improvement in visitor knowledge will result in an increase of desired behavior and decrease in problems caused by undesired behavior. This fact has been demonstrated on a number of wilderness areas with developed information and educational programs. Bradley (1979) reports that qualitative results were noted, including noticeably less impact on the land itself, as a result of various information and education programs utilized on the Eagle Cap Wilderness of the Wallowa-Whitman National Forest. Wilderness managers on the Superstition Wilderness of the Tonto National Forest report visible improvement in users' behaviors, attributed to an expanded information and education program.

The value of increased visitor knowledge has been reflected in the Santa Fe National Forest Land Management Plan, and associated environmental impact statement (1987). The plan says the Forest will provide adequate personnel to communicate information regarding wilderness and desired behavior to the wilderness users. Various techniques for improving information and education are outlined, and a goal of reducing impact through education is stated.

A paper prepared for the Clemson University Recreation Short Course by Brad Powell (1987), then District Ranger of the Pecos Ranger District, also addressed the needs of increased efforts of visitor education. Powell particularly stressed the need for more educational efforts targeted at the large groups which use the wilderness. In addition, the need to target users coming from non-local areas, and the need to provide contacts in the field were stressed.

The variety of information and education techniques which have been tried in the past have met with mixed results. Anderson (1981) and Fazio (1978) have shown that slide-tape programs can be effective tools to increase

knowledge of low impact camping. Educational brochures have been found ineffective as a method of increasing awareness of no-trace camping by Polowitz (1982) and Fazio (1978). Educational pamphlets have been found useful in redistributing backcountry visitors (Krump, E.E.; Canon, et al., 1979. Fazio (1979) found the mass media not very successful in reaching a large number of wilderness users. Generally, it can be stated that there is not enough data on the effectiveness of various techniques, and more research into this question needs to be done. Most managers believe that personal contact is much more effective in changing visitor behavior than written materials, but in some situations this is not the case (Roggenbuck and Berrier 1981). Cole, Peterson and Lucas (1987) provide a detailed analysis of techniques used in wilderness management problem solving, and conclude that the effectiveness of low-impact educational techniques have not yet been evaluated systematically, but their potential seems great.

As important as education is to influencing desired behavior, education alone will not always produce the most effective results. The need of supporting educational efforts with regulatory efforts is clear (Robertson, 1983; Bradley, 1979; Hampton and Cole, 1988).

A historic look at the forest service's ability to adequately manage wilderness, tempered with the potential loss of management funding, demonstrate the value of developing partnerships in expanded visitor educational efforts. This need for partnerships in National Forest management is emphasized in the report from the President's Commission of Americans Outdoors, the Chief of the Forest Service's "National Recreation Strategy", and the Santa Fe National Forest Land Management Plan.

Finally, ways to monitor the effectiveness of increased educational efforts was looked at.

III. ANALYSIS

A. USE CHARACTERISTICS

Powell (1987) undertook a detailed examination of wilderness permit information from 1973 to 1985, and identified the significant characteristics of visitor use. Some of the characteristics which are relevant to planning for increased education efforts follow.

The typical visit to the Pecos Wilderness consists of a group of two people residing within a 150 mile radius of the area. The visit occurs in July and August and usually is of a 3 to 4 day duration. The principle method of travel is hiking. The Jacks Creek or Iron Gate trailheads are most likely the points of entry. The travel zone that encompasses the Pecos River and the Mora River drainages is generally the destination.

1. More Hikers

Walking is the predominant method of utilizing the wilderness. This type of use has grown to 90% of all users. In 1967, it was estimated that 38% of the visitors were walkers. This change appears to be relatively stable with little fluctuation in the use percentages in the last 10 years.

2. Length of Stay Declining

The average length of time that people utilize the wilderness is declining. In 1973, the average visit was 4.8 visitor days, in 1985 it had declined to 4.3 (3.7 including day use estimates).

3. Group Size is Declining

The average group was 3.7 people in 1973. It declined to 3.3 people by 1985. Two party groups were the predominant group size. Use by large groups (15+) declined.

4. Predominant Use is Summer

July and August were the most heavily utilized times through the period of analysis.

5. User Origins Little Changed

No significant trends in states of origin could be recognized. It did appear as if more use was coming from areas other than Santa Fe, which indicates a broadening of the use as the wilderness becomes more popular.

6. Use Distribution Still a Problem

Most of the trailhead use is concentrated on a few major areas. Jacks Creek and Iron Gate trailheads account for 54% of the use. The Pecos and Mora Rivers receive 62% of the use.

Some improvement in the use distribution from the travel zones encompassing the high mountain lakes, Beatty's Flats, Pecos Falls, and the Mora Flat area has occurred as a result of the overnight restrictions placed on them in 1976.

Powell's data must be recognized to be subject to further manipulation since the permit data he used did not totally reflect all use. He states that use by locals without a permit was common, and it is believed that a significant number of day users never obtained permits either.

B. PROBLEMS AND THEIR CAUSES

To make increased information and educational efforts as effective as possible, it is necessary to clearly identify what the problems are we wish to address, and what are the perceived causes of these problems. The word "problem" in this application can be rather subjective, since what is one person's problem may be another's solution. A starting point in identifying the problems associated with visitor behavior is resource impact most commonly visible through erosion, wastes, vandalism and loss of pristine integrity. Further, less tangible impact deals with social effects through altered experiences. The first type of impact is somewhat quantifiable, whereas the second type is nearly totally subjective. The following discussion on the problems of the wilderness resource resulting from visitor behaviors originates from first hand observations, as well as observations and opinions of numerous individuals who have worked in the wilderness for a number of years.

The focus of this analysis is on the recreational visitor. Recreational opportunity is just one of the many wilderness assets, but recreational use has the potential to result in numerous problems. This gives the wilderness manager a clear focal point with the potenial of large returns in effecting behavior in wilderness..

To anyone familiar with wilderness management, it is clear that most visitor related problems are not specific to one wilderness, but rather common to most wildernesses. Occasionally unique problems exist around a unique physical or social setting, but generally visitor related problems in the Pecos Wilderness are very much the same as in other wildernesses. Washborne and Cole (1983) surveyed 152 wildernesses for visitor related problems in 1979 and the problems they identified are the same as those which exist on the Pecos Wilderness.

1. PROBLEMS

Trail Deterioration

The Pecos Ranger District has received numerous complaints about deteriorated trail conditions. Trail impact becomes a problem when managed trails deteriorate to the point where they are hard to use, or where unmanaged trails are developed by visitor use. When trails are very muddy, or deeply eroded they are hard to use. Shortcutting switchbacks promotes erosion, and traveling off the trails promotes multiple trails. Trail problems result from improper and/or too much use as well as poor trail construction and/or maintenance.

Campsite Deterioration

In Washborne and Cole's study of wilderness managers, more than 70% listed vegetation loss and soil compaction at campsites as frequent problems. It is a significant problem in the Pecos Wilderness. As with trail

deterioration, there are problems with both the deterioration of campsites in desired locations as well as proliferation of campsites in undesired locations.

Litter

Litter or garbage left in the wilderness is simply a result of people intentionally or unintentionally failing to remove it. The garbage problem along trails, streams, lakes, shores, and in campsites is apparently growing in the perception of local managers. Litter ranges from cigarette butts and candy wrappers to discarded camping equipment and livestock gear. Numerous complaints have been received about trash in the wilderness.

Packstock

Packstock problems can be associated with trail and campsite deterioration as well as crowding and user conflicts. Also, deterioration of grassy areas from excessive grazing, or grazing in fragile areas, or at times of the year when fragility is high, are problems. In the Spanish Peaks Wilderness of Montana, researcher Sidney Frissell (1965) found horse camps to be larger than hiker camps, with seven times as much bare ground. Although no hard data exist for the Pecos Wilderness, a perception exists that this situation is true.

Human Waste

Human waste becomes a problem primarily where use is relatively high. Elsewhere, decomposition usually eliminates wastes before they become a problem. Unburied feces and toilet paper are a common sight at most popular camping areas.

Wildlife

Disturbance of wildlife results from harrassment, intentional or unintentional, and competion. Pets commonly harrass large and small animals. Overgrazing certain areas causes unneeded competition. Visitors impact habitats along trails and at campsites. The problem of impact on wildlife in the Pecos Wilderness is again a perceived one, as no hard data exist to confirm this.

Water Pollution

Associated problems of human waste disposal present the greatest threat to visitors. Additonally, there is concern about subtle changes that result from pollution of bodies of water which effect water quality and aquatic flora and fauna. Bathing and washing equipment with soaps have potentially very serious, but undocumented, consequences in the Pecos Wilderness.

Sociological and Aesthetic Conflicts

Whether visitors feel crowded or not is not readily identifiable. Comments received informally, and formally, do indicate some other rather serious conflicts however. Numerous complaints have been received about trail conditions, particularly muddy trails, which have been attributed to packstock use. Powell (1987) identified a growing conflict between hikers and horse users. Comments regarding the loss of a sense of solitude have been received, and when one observes dozens of camps in some of the more popular locations, or sees scores of trail users along a few miles of a trail, it leads one to believe that a sense of solitude is not readily felt by many visitors. Also, vandalism to trail signs and natural features is an all too common sight. The loss of trail signs has very serious consequences through lost visitors, which has happened in the recent past.

Fires

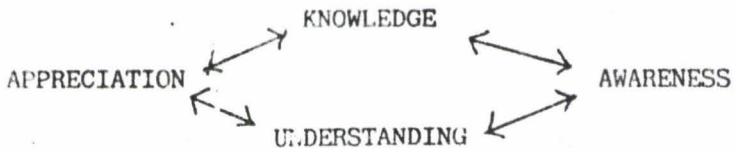
The use of fires results in blackend rocks, sterilized soils, and visual evidence of a lack of naturalness. In addition, there is a serious loss of dead and down wood in popular areas. Too often green trees are cut in an attempt to provide firewood. Associated with fires is the problem of burning trash. Many so called burnable objects actually just melt and leave behind residues. It is common to find fire rings loaded with bits of aluminum or plastic which were not consumed. It is also possible to find several fire rings in a single campsite.

2. CAUSES

Why are visitors negatively impacting the Pecos Wilderness? The answer to this question is very complex. Deliberate criminal behavior is believed to be a very minor cause. One obvious answer is simply the great number of people that visit the wilderness, coupled with the fact that the majority of these visitors utilize only a small percentage of the land area. The Pecos Wilderness is within an easy drive of over half a million people, and there are a relatively small number of access points into the wilderness. These are certainly legitimate causes which need to be addressed in efforts to reduce impact.

But, a far more important cause exists. A cause which is not easily defined, nor easily addressed. In its simplest terms, the cause of growing problems related to visitor impact is visitor ignorance and loss of sensitivity.

Visitor ignorance sometimes is a result of a lack of sensitivity, for if you are not sensitive and appreciative of something, you likely are not understanding of it or aware of its true essence. Conversely, if you are lacking knowledge or information about something, you can not be truely understanding or sensitive to it. This concept can be further defined by the following diagram.



Visitor ignorance can be simply a matter of a lack of information. A wilderness user may be ignorant of the fact that a certain trail or camping area is heavily used, and that his/her use of that area will contribute to problems. Or a visitor may be ignorant of the fact that if he/she builds a fire in a certain manner, makes their camp in a certain place, or tethers their livestock in a certain way, they can prevent problems. Information and educational efforts to address this type of ignorance are very necessary and important. Many problems can be addressed through simple messages and demonstration.

The lack of sensitivity of visitors cannot, however, be addressed simply through the sensitivity and appreciation which comes with more knowledge or information. There is a much more complex issue here with deep roots which extend far beyond any wilderness boundaries. That issue has been called by some a "land ethic." Some of the visitor characteristics associated with a land ethic are self-control, respect, responsibility, absence of greed and abundance of fairness, caring personal involvement, empathy, consideration of others, and a sense of stewardship in the process of protecting and maintaining an outdoor environment while being able to enjoy it.

Aldo Leoplold (1949) in his writings looked closely at this issue and attributed what is an apparent loss of a land ethic by citizens of this country to their removal from the land and their increasing urbanization. Since Leopold's time the trend has continued. Some predict that by the year 2000, 80% of the American public will be living in urban areas. The urban world increasingly experiences the world vicariously. People acquire what knowledge they have through limited observation and even more limited direct experience. It is understandable that wilderness visitors are not sensitive to the land's needs when one realizes that so many of them have so little contact with the wilderness. It is a foreign place which needs to be made more familiar by "things" (tents, stoves, lights, etc..) which help to keep us further separated from the land.

The philisophical and intellectual roots of the land ethic go very deep and spread very wide. It is beyond the scope of this paper to discuss this issue fully. It is hoped that the issue of a land ethic will be addressed at a much higher level. Since both wilderness visitor behaviors and global deforestation and warming are born out of the same minds.

In simple terms, the cause of the problems the Pecos Wilderness is having is people's actions. Knowledge, skills, attitudes, and experiences all combine to result in people's behaviors in the wilderness. These elements are as interrelated as the parts of an ecosystem. Inappropriate attitudes, for instance, are often a blend of misinformation, lack of knowledge,

indirect or vicarious rather than personal or direct experience with the natural environment, and undeveloped or limited skills. Lack of sound knowledge, appropriate attitudes, and skills for responsible decision-making combine too often to create increasingly inappropriate behavior and its consequences.

C. MANAGEMENT DIRECTION

The issues involved with information and education of wilderness visitors have been recognized at many levels, and direction on ways to address these issues have been clearly outlined.

The Wilderness Act of 1964, does address the issue of visitor information and clearly states intentions, and management objectives, which require educational efforts. Section 2.(9) of the Act states that wilderness areas:

> "...shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpared for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness..."

In 1985, the president of the United States established a blue-ribbon commission to develop a plan for protecting and enhancing America's recreational resources and opportunities today and for future generations. Among other topics, one which was addressed by the commission was outdoor ethics. The Commission recommends:

> "(1) each...community...develop an outdoor ethic and work toward reflecting that ethic in personal and organizational actions;..."

The Commission cites information and experiences as the keys to promoting an outdoor ethic. Promotion of an outdoor ethic is the responsibility of every American. Testimony presented by the State of Indiana summarizes the importance of this initiative:

> "Conservation education and outdoor ethics are the thread that holds together the future of outdoor recreation."

The Commission adds:

> "With a broad based outdoor ethic we all become stewards of out outdoor estate. And future generations, as well as our own, will be richer for it."

In 1987, the Interagency Task Force on Outdoor Recreation Resources and Opportunities was chartered by the Domestic Policy Council to prepare proposals for the president to further develop outdoor recreational opportunities. In fulfulling its assignment, the Task Force prepared a comprehensive analysis in which it declared a strategy that federal agencies should work to encourage a renewed outdoor recreational ethic for America's communities. They state that:

> "A renewed recreation ethic means assurance that public use of...lands brings with it responsible user care for the land and its resources.."

Also in 1987, Dale Robertson, Chief of the USDA Forest Service, unveiled a new plan, compiled by six separate commissions - Customers, Marketing, Partnerships, Recreation Setting, Services, and Technology - outlining a new strategy for managing recreation on national forests. As part of the "National Recreational Strategy Project", the commissioners networked with hundreds of people inside and outside the forest service, and had lengthy public review of their work. The NRS reflects the needs and wants of both national forest "customers" and managers. One strategy identified to help create customer satisfaction is:

> "Provide interpretation, information, and environmental education as an important part of outdoor recreation. Promote a better understanding of the long-term compatability of people living in harmony with nature. Promote an outdoor ethic among users."

The Santa Fe National Forest Plan (LMP), and the Environmental Impact Statement (EIS), emphasize the need for improved information and educational efforts. The Forest's long term goal is to manage wilderness to preserve and protect the wilderness character. It further states that it is essential to better distribute visitors to reduce the negative impact associated with the heavy use which takes place in the more popular areas of the wilderness. Wilderness recreational demand is forcast to double in the next 50 years. The EIS states that there is a need for:

> "Adequate personnel (to be) available to communicate to visitors the need for dispersal, where isolation and other opportunities can be found, low impact camping techniques, and the special sensitivity requirements of alpine tundra areas. The.... emphasis will be on personal communication and education."

Futhermore the LMP states:

> "Encourage visitors to adopt techniques, equipment, and ethics, and to seek less crowded country to minimize impacts on the wilderness resource. This includes...education in `no trace' wilderness camping ethic."

To accomplish this the LMP says:

> "Communicate the above concerns through personal contacts by wilderness information specialists (WIS) or rangers. Standard service level includes patrol of trails, at least two visits per week to high and restricted areas,...visitor contacts at high use trailheads during weekends and peak use periods..."

It is clear that from a nationwide perspective, down to the level of the Pecos Wilderness, the need for improved information and educational efforts and the need for an outdoor recreational ethic is strongly recognized. This recognition takes the form of policy through the NPS and the LMP. Managers of the Pecos Wilderness are not only encouraged to take action, we are directed to do so.

D. TACTICS, TECHNIQUES, TOOLS

"You can't spell it out too simply for the average camper. Look how long we've had the Smokey the Bear and Woodsy Owl warning the people about fires and litter. Have careless people stopped burning down forests? Don't we still have litter in the backcountry? Aim your sights on the wilderness user who creates the mess for the rest of us." 1/ These are the words of a Forest Service ranger addressing the authors of a minimum-impact techniques book. These are the words of a dedicated land manager who has stood at trailheads handing out brochures describing conservation practices, only later to find them waded up and trodden underfoot by an army of hiking boots in the backcountry. "Keep it basic. Capitalize the rules, underline them, and then drive them home with a sledge hammer," he admonishes. 1/

As harsh as this may sound, the ranger's words bring out some very key points in looking at tactics, techniques, and tools to accomplish information and education (I&E) goals. I&E must be understandable and simple for the users. Trying to make someone understand the intricate physiology of vegetation, or the habitat needs of wildlife, can not be done in a five minute visit to the Ranger Station. Secondly, rules are important for a balanced I&E program. It is naive to assume all users can be taught enough rationale for the "right" kind of behavior. In the past, wilderness management agencies have relied very heavily on rules to facilitate desired behavior. Rules and regulations by themselves are not the answer however. Aldo Leopold (1949) questioned the effectiveness of regulation forty years ago: "Objectives have no meaning without conscience..."

1/ Soft Paths. Stackpole Books, Harrisburg, PA., 1988

In looking at what works and what doesn't, we must keep in mind that education and rules go hand in hand.

1. Education

The usual answer to the expressed need of improved I&E for wilderness users is "more." This is undoubtedly true, but is it certain that only the volume of I&E needs stepping up, or are the content and applications in need of improvement as well? After all, those of us who are attempting to "educate" generally have no training or experience in education. The number of functional illiterates that our educational system produces should not make us sanguine about educating thousands of wilderness users to respect the earth, a much harder form of literacy. But considering the alternative, we must try.

There are two tactics we can implement which will help us focus in on the task. Target efforts are focused both towards "off site" and "on site."

a). Off-Site Efforts

Off-site efforts are those actions directed towards a target audience of potential visitors prior to their visit.

Potential visitors come from known user groups and clubs, as well as local schools, churches and scout groups. Wilderness permit data indicate that there are several key geographical locations which could be focused in on.

The efforts or techniques which could be used include:

1). Working with the media: Undoubtedly the tool with the greatest potential for reaching and influencing people is television. The effectiveness of televion in influencing people's attitudes about the outdoors is demonstrated by the substantial number of people who have had their minds changed about wildlife and wildlife habitat. Over the past thirty years there has been a flood of wildlife television programming. This has influenced many young people to feel kindly towards wildlife, including the predators, which not too long ago were viewed as having evil natures. These films appeal to the Bambi impulse, featuring cute pairs of bear cubs, river otter pups, or cheetah kittens which go out into their wilderness environment and through comic misadventures learn about life. By making a niche for itself in television programming, wildlife advocates may have done more for their cause than all the devoted organizations together. 1/

1/ "Living on Our Principle" Wallace Stegner in Wilderness, Spring 1985.

As tremendous a tool as television is, a more realistic approach for a ranger district to take may involve other media such as newspapers, magazines and radio. It could include such items as efforts to protect the wilderness resources, low-impact techniques, and feature stories.

2). Educating youth: The importance of reaching the young people of this country with messages which influence attitudes and behaviors and which lead towards the development of an outdoor ethic, cannot be overemphasized. If a mind can incorporate the understanding of the "rightness" of respecting the wilderness, before destructive attitudes and behaviors are learned, the result is an individual who does not grudgingly consent to behave in ways recommended, but rather an individual who enthusiastically advocates that type of behavior. It has been said many times regarding a variety of issues, but certainly applicable to the wilderness that:

Our future lies in the hands of our children.

The most obvious place to start is with the local schools. There are presently environmental education programs available which have been designed specifically to work into school cirricula. Project Learning Tree (PLT) is a general environmental education program, with applications from grades K-12. Project Wild is a wildlife and wildlife habitat program for all grades also. While these programs do not address wilderness issues specifically, they do so indirectly. After all, the more knowledge a child has about the natural world, the more appreciation and respect the child will have. The emphasis in these programs is to "teach the teachers," so they in turn can teach the children through incorporating environmental education lessons with their "regular" schoolwork. The forest service in New Mexico is attempting to encourage greater involvement in these programs by its employees and is a co-sponsor of PLT.

There are many other ways of reaching youth, both through their schools and through organizations such as scouts, 4-H, athletic teams and churches. Techniques can be as simple as a talk by the ranger to "Impact Monster" skits or "Skills Trail" involvement. A resource book with the best environmental education tools for applications for youth education will soon be available through the Washington Office of the forest service. The keys to successful youth educational efforts are to first, make the necessary contacts with the leaders, principals, and teachers who can make the necessary arrangements. Second, remember that youth have short attention spans and are best approached with lots of involvement and attention-grabbing techniques like visual aids.

3. Educating User Groups: A significant number of wilderness users are members of sportmen's groups, (i.e. hunting, fishing, off road vehicle, snowmobile and horse clubs). Furthermore, a significant number of users, particularly day users, come from a nearby church-affiliated conference center. Not all these groups participate in group activities in the wilderness, but many do, and many individuals within these groups are

wilderness users. Clubs and organizations are effective in addressing a number of potential wilderness users with a single effort. Techniques can be similiar to those used for educating youth, with adaptations for a specific audience. Messages and demonstrations directed towards a specific group's interest may be most appropriate. For example, a group which holds an annual trail ride into the wilderness can be addressed about negative impact, as well as low-impact techniques associated with packstock use. The first step in educating user groups is to identify the group, make contacts with the appropriate officers, and meet with them to listen as well as share ideas and concerns.

4). Reception desk education: Thousands of wilderness visitors every year, call, write, or stop by the ranger station requesting information. A low-impact message should be a part of every contact. This should be as personalized as possible. If brochures are used, notes in the margins emphasizing the most important messages should be made. The employees responsible for this information should receive the proper training to be able to explain why behaviors or regulations are encouraged. Information receptionists could also participate in youth and user group educational efforts to increase knowledge and effectiveness.

5). Other opportunities: Messages of wilderness sensitivity and low-impact techniques can be delivered in many forums. State and county fairs, parades, outdoor equipment trade shows, slides or video shows for loan, campground presentations, presentations by local national and state parks, recorded phone messages, and any other opportunities which arise should be considered.

The content of the messages in all of these activities would vary depending upon the specific audience and forum, but information about the Wilderness Act and its intent, low-impact user techniques, the value of ethical behavior, and alternatives to wilderness experiences would be the key messages.

b). On-Site Efforts

Mark Twain once said "I have never let my schooling interfere with my education." What Mr. Twain was saying is that most of the time our schooling consists of information which we regurgitate. Education should not be regurgitation. Education should be involvement.

The off-site educational efforts, although potentially very important, are mostly information sharing efforts. Like much schooling, the real learning is hard to differentiate from regurgitation. We cannot assume potential visitors really understand what low-impact techniques are, or why the need for them simply from us explaining how and why. If we really want to assure that we are understood, we must become involved with the visitors, become part of their activity and help them understand what is the proper ethical behavior by example and demonstration. "Personal guides" to low-impact techniques and wilderness ehtics is what would be most

effective.

Given the fact that presently we barely have the resources to contact a fraction of the wilderness users off-site or on-site, it is doubtful the forest service can provide "personal guides" for its many users, unless we have help. There are many interested individuals and groups who can help provide "hands-on" demonstrations and example-setting activities. The volunteer resource is potentially very significant for providing more personal contacts with wilderness users. This resource has been tapped in other areas to the extent that large, continuing visitor information programs have been developed with significant results. The leader in this effort in the Southwest Region of the forest service is probably the Mesa Ranger District of the Tonto National Forest. It may be hard to duplicate their success in developing a volunteer I&E program since they have more immediate access to and from a huge metropolitan area (million plus), but it is reasonable to expect that some program can be initiated. Little has been done up to this point to tap into the potential of the volunteer resource in our area.

The on-site part of I&E efforts involves personal contacts at the trailheads, on the trails, and in people's camps.

1). At the trailheads: Trailheads present an opportunity to have personal contact with nearly all wilderness users. The potential for positive results from these contacts is tremendous. Up to date information is presented to users as they enter the wilderness, when their minds are more focused on the wilderness experience than when they read a brochure or talked to a receptionist several weeks prior to their outing.

The trailhead contacts, often times refered to as Wilderness Information Specialists (WIS's), should be well trained and carefully selected because their function is so critical to the whole I&E program. WIS's should have communication skills, be outgoing, persuasive, and make good first impressions. They also must have a sincere belief in the land ethic messages they communicate. Training in the Wilderness Act and its intent, policies, regulations, low-impact techniques, and communication skills should be provided to WIS's. Knowledge of the wilderness, its trails, attractions, and problem areas are also very important because they can play a key role in helping disperse use away from crowded areas.

WIS's can function as a daily resource, camping at the trailheads, or working only during peak periods. A real benefit can be derived if WIS's have some sort of hospitality to offer users before they start off onto their journey. A seat and a cup of coffee or a glass of water can help facilitate better communication and provide a greater opportunity for real dialog, as opposed to a quick lecture.

WIS's can also help keep visitor use records which help in planning future and additional I&E efforts.

A less personal but potentially important trailhead contact is through the bulletin board or "information node." Attractive stations with a map and messages on low-impact, as well as important regulations, can be very valuable resources. These information nodes deliver messages at trailheads without WIS's, or at times when WIS's are not there. They also help reinforce some of the messages the WIS's deliver. These information nodes should be well maintained and designed to be attractions, as opposed to so many bulletin boards which contain nothing but negative messages.

2). On the trails: Only a small percentage of wilderness visitors can effectively be contacted on the trails because of the large number of trails and small number of "wilderness rangers." Groups or individuals who, through previous contacts by WIS's or district receptionists were not perceived to be very receptive to low-impact messages presented to them, can be targeted and re-contacted enroute to their destination. A more concentrated effort to reach these people can be made by the wilderness rangers rather than wandering through the mountains making random contacts.

3). In camps: Similiar to contacting visitors on the trail, contacting people at their camps presents a somewhat limited opportunity to reach many individuals. However, the effectiveness of these contacts is potentially quite valuable. Visiting with people in their camps presents an opportunity for relaxed conversation and true dialog, as well as an opportunity to demonstrate low-impact techniques first hand. Impact from previous use can be pointed out and ways to avoid creating further impact can be shown.

Efforts to educate visitors in their camps must be made with good judgement. The visitor's attitudes must be closely monitored during the visit. The visit may be perceived as an invasion of privacy by the visitor. Care must be taken not to create resentment or to infringe on the visitor's opportunities for freedom and solitude which are so paramount to the wilderness experience.

On-site education offers tremendous potential for reaching large numbers of wilderness visitors with desired messages. It also offers the best environment for delivering these messages, since hands-on participation and involvement can be a part of the educational experience. Individuals involved in on-site educational efforts must be skilled and properly trained in order to be most effective.

2. Integration of I&E with Regulations

As was previously stated, rules are an important balance to an effective I&E program. In fact, a very real part of I&E efforts is to help people understand what the rules are, as well as why they are.

In their book, Wilderness Management, Heedee, Stankey, and Lucas talk about "direct management" versus "indirect management." Direct management emphasizes influencing or modifying behavior. The concept of wilderness as an undeveloped, free, open, and unconfined place accentuates the desireability of a management philosophy that is an indirect, unobstructive, and subtle as possible. They state that indirect management should be the first choice, since it is best received by visitors. Nevertheless, they also state that direct controls are necessary.

The preference of indirect management over direct management is also stated in the Santa Fe Forest Land Management Plan.

And Bradley, in his 1979 paper, addresses the need of managers taking a more "humanistic" approach to wilderness management, and to rely less heavily on rules and regulations and their enforcement.

Many of our wilderness regulations control, or attempt to control, personal and not criminal behavior. Regulations on soaps, human waste, camping locations, and campfires are examples. Visitors who violate this type of regulation do so more from ignorance than from malicious destructiveness. Changing people's personal habits is more of a job for educators than policemen. It is more a matter of attitudes and awareness than of rules and regulations.

E. SUMMARY

Good data exist regarding characteristics of use. The who, where, and when questions of visitor use are clear enough to target I&E efforts.

The problems the Pecos Wilderness is experiencing are similiar to the problems other wildernesses experience. Most of these problems are a result of inappropriate or undesireable behaviors and use patterns. They result more from ignorance and lack of sensitivity than from blatant hostile intent. Improvement in visitor knowledge and understanding of the sensitive nature of wilderness is believed to be the key in reducing negative visitor-related impact.

The development of an outdoor ethic by visitors through increased Forest Service I&E efforts is not a realistic goal given the complex nature of ethics. Improvements in behavior, however, can result from improved I&E efforts.

The management direction is clear from all levels; improved I&E efforts must be made.

Finally, there are a number of tactics, techniques, and tools which can be utilized to help educate wilderness visitors, both before they go to the wilderness and once they are there. By balancing educational efforts with the least enforcement efforts as are necessary, positive results can be achieved as evident by attempts made previously in other locations.

IV. PLAN DEVELOPMENT

An effective I&E plan for the Pecos Wilderness must look at site or area-specific needs and tailor efforts to varying audiences and media. The effectiveness of I&E efforts should be monitored and evaluated so the program can be adjusted to maximize resources.

A. Implementation Considerations

Before preparing an action plan there is a need to address items regarding the situation surrounding the Pecos Wilderness which have implications to an I&E plan. Consideration of these items will be given when preparing the action plan.

1. Coordination: The Pecos Wilderness is administered by 4 Ranger Districts on 2 National Forests. The wildlife in the wilderness, which draws a significant percentage of the recreational users for hunting, is managed by the New Mexico Department of Game and Fish which maintains an administrative cabin within the wilderness. The Pecos National Monument, administered by the National Park Service and located on the main access route to the wilderness, serves as a jumping off point for many wilderness users.

Given these facts, it is clear that to implement an effective I&E program, efforts must be made to coordinate actions between the involved parties.

Coordination efforts should involve: 1) training of field representatives so that the same messages are delivered by all; 2) sharing of information regarding contacts and use observations so that more effective on-site efforts can be made; 3) planning I&E efforts to most effectively reach the target audiences and avoid duplicating efforts.

2. Partnerships: The resources available by the forest service to develop and sustain an effective wilderness I&E program are presently marginal and subject to substantial decrease. Staffing and funding of a strictly forest service program cannot be relied on and should not be planned for.

There are a number of groups and individuals interested in improved conditions for the Pecos Wilderness. The Sierra Club, Volunteers for the Outdoors, and Santa Fe Mountain Center are obvious potential partners in developing and sustaining an I&E program. Commercial users (i.e. outfitter/guides, range permitees, etc...) are also a potential source of I&E partnership efforts.

If a program could be developed with a sense of ownership by all interested parties, its effectiveness would be improved and its sustainability would be assured and not threatened by forest service budget and staffing fluctuations.

3. Use Factors: In addition to the use characteristics identified by Powell, and previously mentioned, the following use factors should be considered in action plan development.

An unidentified, but probably significant, percentage of the Pecos Wilderness use is local in origin, and traditional in practice. In character with the cultural norms of northern New Mexico, traditions are highly valued and strongly protected. Unfortunately, many of the traditional wilderness uses are also highly destructive. It is common to see large, mounted hunting groups headed for customary, and usually very sensitive, campsites. Low-impact practices have not been traditional. Obviously there is a special challenge to be addressed in trying to educate traditional users.

Another factor which should be planned for is seasonal use. The quantity and type of user changes significantly throughout the year. The early spring use is low and usually involves experienced hikers or skiers taking advantage of the solitude which can be obtained at this time of year. Summer use is the heaviest, particularly at holiday times, and is more family-oriented. A lot of day use occurs during the summer. The fall brings out the hunters, either guided or on their own. Although user numbers may go down from the summer peak, fall use is usually assisted by livestock and has significant use patterns. Winter time is a period of sparse use, usually involving short backcountry ski excursions around the perimeter.

4. Training: As was previously mentioned, education is a difficult task for professionally trained educators. There are no professionally trained educators immediately involved from the forest service on an I&E program. In addition to trying to involve educators through partnerships, it is important to provide training to those non-educators who will be trying to educate.

Skills in communication are probably most important. Individuals contacting users must be skilled enough that messages can be customized to the user, and that feedback skills can be used to check on the effectiveness of the message delivered.

In addition to communication skills, training should be provided to all educators about the subject matter. Many forest service employees who either formally or informally contact potential wilderness users are not knowledgeable about low-impact practices or the rationale for them. Nor are they knowledgeable about the history and intent of the Wilderness Act! If we are to have any hope of educating the visitor, we must first educate ourselves.

Another potentially valuable training opportunity involves Project Learning Tree and Project Wildlife. As was previously mentioned, these educational programs are designed for school teachers to incorporate into their regular curriculum. The awareness and understanding of natural environments which

can be obtained through these programs, will carry over into the wilderness environment. Local forest service involvement in these programs could do much to begin to address the issue of traditional uses and users.

B. ACTION PLAN

Presently there are no organized information and educational efforts taking place on the Pecos Ranger District. This action plan is to serve as a foundation for development of an effective wilderness I&E program.

This action plan will serve as a guide for the district wilderness management staff to utilize in planning annual I&E implementation actions. The annual implementation schedule will address specifics, as well as updating target problems and audiences. Cost and benefits may be addressed at that time if there is a need to do so.

The GOALS of this action plan are:

1.) Educate potential users about the Wilderness Act and designated wilderness.
2.) Modify the type of use and visitor behaviors.
3.) Increase visitor awareness of the Pecos Wilderness, recreationaluse patterns in the wilderness, and trip planning considerations.

The OBJECTIVES of this action plan are:

1.) Inform about appropriate wilderness uses.
2.) Inform about wilderness rules, regulations and orders.
3.) Inform of damaging practices and behaviors.
4.) Teach low-impact skills, techniques and behaviors.
5.) Inform about sensitive or fragile areas.
6.) Inform about wildlife needs in relation to recreational use.
7.) Inform about heavily used areas.
8.) Inform about recreational opportunities in less heavily used areas within the wilderness.
9.) Inform about recreational opportunities outside of the wilderness.
10.) Inform about disadvantages of heavily used areas.
11.) Inform about high and low use periods.
12.) Inform about periods of high impact potential.
13.) Teach a wilderness ethic.

These objectives will be incorporated into the appropriate action plan efforts, and the information or messages will be tailored to fit the situation.

ACTION PLAN

A. Off-Site Actions

1. Media Involvement

-Make "contacts" with newspaper, radio, and television resources in Santa Fe and Albuquerque. Find out how to utilize these resources to disseminate information. Tools to focus on are public service announcements, feature stories, and coverage of attractive wilderness-related projects (e.g. education programs, clean-up or rehabilitation projects).

-With the help of the Forest Public Affairs Officer, monthly news releases regarding trail conditions, problem areas and seasonal considerations could be issued.

-Contact other Pecos Wilderness managers and coordinate all media involvement to be sure to address wilderness wide needs.

-Contact the New Mexico Department of Game and Fish Public Affairs Office to explore ways of coordinating message deliveries (e.g. leaflets or brochures sent along with hunting licenses issued for the wilderness hunting unit and hunter safety course participation).

-Explore opportunities for media involvement in the non-local communities of eastern New Mexico and western Texas, where known user groups originate.

2. Youth Education

-Develop wilderness education programs targeted for youth of various ages. Utilize existing resources such as Skills Trail, Impact Monster skit and lesson plans as much as possible to avoid "re-inventing the wheel."

-Contact local schools and arrange for involvement. Find out which teachers are most receptive to wilderness educational involvement and coordinate activities to get the best results from efforts.

-Schedule a Project Learning Tree workshop for local teachers who are interested.

Contact local youth groups such as Scouts and 4-H, and arrange for presentations.

3. Adult Education and Information

-Organize a low-impact skills training session for outfitter/guides and grazing permitees.

-Train receptionist about low-impact skills and how to deliver these messages personally and via correspondence.

-Include wilderness education in the orientation of all employees, both temporary and career.

-Contact groups of livestock users with low-impact messages before they arrive in Pecos. Utilize the volunteer register in office to make contacts.

-Arrange for low-impact training for public contacts at the Pecos National Monument and for local New Mexico Department of Game and Fish officers. Incorporate desired messages into programs presented by Pecos National Monument.

-Contact Volunteers for Outdoors, Sierra Club, and Santa Fe Mountain Center to see how desired messages may be incorporated into their programs, and how they might help in educational efforts.

-Arrange for appropriate training of wilderness crew regarding distribution of information and low-impact skills.

Contact Glorieta Baptist Conference Center, and local resorts to arrange for presentations and distribution of information.

4. General Education/Information

-Develop a wilderness educational display which can be utilized at the county and state fair, trade shows, or any other opportunity to spread appropriate wilderness information.

-Purchase a video player to show No Trace Backpacking and Techniques and Equipment for Wilderness Horse Use video tapes to users while at the ranger station.

-Develop a wilderness education program for use in the area campgrounds. Train Camp Hosts to deliver the program.

-Explore the possibility of establishing a wilderness information call number and taped phone message.

Start a photo/slide library which can be used for media contacts, educational programs, and historical records.

Recruit volunteers for a Wilderness Information Specialist (WIS) program. Sources may include Volunteers for Outdoors, Sierra Club, St. John's College, and as yet unidentified groups.

B. On-Site Actions

1. Trailheads

-Utilize trained WIS's to contact visitors at wilderness entry points to help teach low-impact skills, disperse use through distribution of information regarding heavily used and sensitive areas, and gather data useful to target audiences for off-site efforts.

-Build wilderness "information nodes" at trailheads to provide better information to users. Investigate the possibility of establishing a permanent "information station" at Jacks Creek trailhead.

-Recruit volunteers interested in WIS program and wilderness management.

2. Trails/Camps

-Utilize WIS's for visitor contacts within the wilderness. Schedule patrol work to cover high use periods and areas.

-Train WIS's to effectively provide low-impact demonstrations in users camps, keeping in mind the sensitive nature of the task, particularly with "traditional" users.

-Recognize that visitor contacts within the wilderness offer an opportunity to have a real dialog and hands-on demonstrations which combine to create a true learning experience. It should not be expected that large numbers of these contacts be made in a given time period because the quality of the contact is far more important than the quantity.

C. Follow-up

The effectiveness of the action plan items and the wilderness I&E program needs to be assessed regularly, and if deemed necessary, modifications need to be made. Visitor use is dynamic. The continually changing social makeup of our society demands flexibility and creativity in any program.

The following actions will be taken to help make this program more effective:

-Prepare a simple and easily used questionaire to obtain feedback from visitors regarding I&E efforts and perceptions regarding wilderness experience. Try to find out what is effective and what is not.

-Survey users perceptions regarding changing conditions, particularly in areas which have been targeted such as problem locations or behaviors.

-Implement a Limit-of-Acceptable Change (LAC) monitoring program, to record on the ground impact of changing conditions.

-Review existing rules, regulations, and orders for appropriateness, and modify where necessary to reflect current needs. Make this information available to visitors.

-Explore opportunities for increasing the availability of day hikes and short trips outside the wilderness, and make information known to potential wilderness users.

-Provide continued training for receptionists, wilderness crew and other employees for sharpening of communication skills and knowledge of up to date use and low-impact information. Take receptionists on field trips so that they can speak first hand about information they are giving.

-Explore the degree of livestock versus hiker conflicts and examine potential solutions such as zoning or trail use restrictions.

-Evaluate what the appropriate balance is between I&E efforts and regulations.

REFERENCES

Bradley, Jim, A Human Approach to Reducing Wildland Impacts, in Recreation Impact on Wildlands, Conference proceedings, Seattle, Washington, 1978.

Bradley, Jim, A Blueprint for the Management of the Superstition Wilderness, 1980, unpublished.

Cole, David N. 1981. Managing ecological impacts at wilderness campsites: and evaluation of techniques. Journal of Forestry. 79: 86-89.

Cole, David N.; Dalle-Molle, John. 1982. Managing campfire impacts in the backcountry. Gen. Tech. Rep. INT-135. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 16 p.

Cole, David N.; Marion, Jeffrey L. 1988. Recreation impacts in some riparian forests of the Eastern United States. Environmental Management. 12: 99-107.

Cole, David N.; Peterson, Margaret E.; Lucas, Robert C. 1987. Managing wilderness recreation use: common problems and potential solutions. Gen. Tech. Rep. INT-230. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 60 p.

Fazio, J.R. 1979. Communicating With the Wilderness User. Forest Wildlife and Range Experimental Station, Bulletin No.28, University of Idaho, Moscow, ID.

Frissell, S.S. and Duncan, D.P. 1965. "Campsite Preference and Deterioration in the Quetico-Superior Canoe Country." Journal of Forestry. 63:256-260.

Frome, Michael, ed. 1985. Issues in wilderness management. Boulder, CO: Westview Press. 252 p.

Hampton, Bruce; Cole, David N. 1988. Soft paths: a guide to tomorrow's wilderness. Harrisburg, PA: Stackpole Books. 160 p.

Hart, Paul. 1980. New backcountry ehtic: leave no trace. American Forests. 86(8): 51-54.

Hendee, J.C.; Stankey, G.H.; Lucas, R.C. 1978. Wilderness Management. Misc. pub. WO-1365. Washington, D.C.: USDA Forest Service.

Leopold, Aldo. 1949. A Sand County Almanac, "The Land Ethic." 1968. Oxford University Press.

Lucas, Robert C. 1982. Recreation regulations--when are they needed? Journal of Forestry. 80: 148-151.

"Outdoor Recreation in a Nation of Communities", A Report of the Task Force on Outdoor Recreation Resources and Opportunities to the Domestic Policy Council, July 1988.

Powell, Brad. "Pecos Wilderness Visitor Use Characteristics, (1973-1985)", paper prepared for Clemson University Recreation Short Course, 1986.

"Proceedings of the International Conference on Outdoor Ethics." 1987. Lake Ozark, Missouri.

Remy, Pochelon. "Wilderness Education Program on the Deerlodge National Forest", paper prepared for Clemson University Recreation Short Course, 1983.

"Report and Recommendations to the President of the United States", Presidents Commission on American Outdoors, 1986.

Robertson, Rachel. An Investigation of Visitor Behavior in Wilderness Areas. Doctoral dissertation, University of Iowa, 1981.

Robertson, Rachel. "Visitor Knowledge Affects Visitor Behavior", in Forest and River Recreation: Research Update, Miscellaneous publication 18-1982, The Agriculture Expermiment Station, University of Minnesota.

Roggenbuck, Joseph W.; Berrier, Deborah L. 1981. Communications to disperse wilderness campers. Journal of Forestry. 79: 295-297.

Stankey, George H.; Schreyer, Richard. 1987. Attitudes toward wilderness and factors affecting visitor behavior: a state-of-knowledge review. In: Lucas, Robert C., compiler. Proceedings, national wilderness research conference: issues, state-of-knowledge, future directions; 1985 July 23-26; Fort Collins, CO. Gen. Tech. Rep. INT-220. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 246-293.

Stegner, Wallace. 1985. "Living in Principle", in Wilderness, Spring 1955 issue.

Washburne, Randel F.; Cole, David N. 1983. Problems and practices in wilderness management: a survey of managers. Res. Pap. INT-304. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 56 p.

Williams, Ted. "Why Johnny Shoots Signs", in Audubon, September 1988.

Zaslowsky, Dyan. 1984. "Making the Dream", in Wilderness, Summer 1984 issue.